Product Development of Branded, Packaged Household Goods in Britain, 1870–1914: Colman's, Reckitt's, and Lever Brothers

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The three companies whose history forms the subject of this article became leaders in a sector of the British economy—consumer goods—generally regarded as one of the most successful in the late nineteenth and early twentieth centuries. Product innovation and development, achieved internally or through acquisition, enabled these firms to become market leaders. We therefore analyze the processes of product development within the three firms, using a systematic framework that allows us to offer generalizations about the process of product innovation and development in the consumer goods sector in Britain. We conclude that gradual modification, rather than revolutionary innovation, was characteristic of product development in the household goods trade, and that technology was less important for success than marketing skill.

Much of the literature relating to British industrial history has focused either on the history of technology per se or on invention and innovation in relation to economic growth and productivity. The emphasis has been on the incentive to economize, on labor and capital

Enterprise & Society 2 (September 2001): 503–542.

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We are pleased to express our gratitude to the Leverhulme Trustees, who have funded the research project on which this article is based (F/204/R, 1997–2000), to the editor and anonymous referees of *Enterprise & Society* for their constructive advice, and to the archivists of each of the companies studied for their valuable assistance. Images are reproduced by kind permission of Lever Fabergé and Unilever Historical Archives, of Van den Bergh Foods, and of Reckitt Benckiser plc.

and through the substitution of raw materials.[1] An important, though not uncontentious, distinction between major and minor technical inventions has emerged from this literature.[2] Whereas an older literature referred to heroic breakthroughs or modest adaptations to technology, a process that proceeded along a continuum, more recently the distinctions drawn refer to macro- and micro-inventions or to radical versus incremental technical changes.[3] For the entrepreneur, however, technical change was not necessarily the most important factor in decision making, because ultimately, "viewed *ex ante*, every entrepreneurial decision envisages only profits."[4] If we accept that entrepreneurs' assessments of investment risk required some initial notion of consumers' responses, then the relationships among entrepreneurs, products, and consumers (or distributors) become central to an understanding of the competitive process.[5]

Although historians adopting this approach occasionally have applied it to British business in the nineteenth century, for the most part the tendency has been to focus on technical inventions and innovations that affected how, rather than which and why, products

1. Hrothgar J. Habakkuk, *American and British Technology in the Nineteenth Century; the Search for Labour-Saving Inventions* (Cambridge, U.K., 1962).

2. Gillian Cookson, "Innovation, Diffusion, and Mechanical Engineers in Britain, 1780–1850," *Economic History Review* 47 (1994): 749–53.

3. For the continuum approach, see David S. Landes, *The Unbound Prometheus: Technological Change and Industrial Development in Western Europe from 1750 to the Present* (Cambridge, U.K., 1969). See the historiographical discussion by Peter Mathias, "The Machine: Icon of Growth," in *The Trouble with Technology*: *Explorations in the Process of Technical Change*, ed. Stuart Macdonald, D. McL. Lamberton, and Thomas Mandeville (New York, 1983), 11–25; and Nathan Rosenberg, *Inside the Black Box: Technology and Economics* (New York, 1982), 62–70. For the macro-micro distinction, see Joel Mokyr, *The Lever of Riches: Technological Creativity and Economic Progress* (New York, 1990), 12–14, 292–96. The radical vs. incremental distinction is examined in Christine MacLeod, "Strategies for Innovation: The Diffusion of New Technology in Nineteenth-Century British Industry," *Economic History Review* 45 (1992): 285–307; and MacLeod, "The Peculiarities of Yorkshire Inventors: A Reply," *Economic History Review* 47 (1994): 754–59.

4. Israel M. Kirzner, *Competition and Entrepreneurship* (Chicago, 1973), 83.

5. Recent contributions that have advanced understanding of the development of capabilities within firms include Alfred D. Chandler, Jr., *Scale and Scope: The Dynamics of Industrial Capitalism* (Cambridge, Mass., 1990), 14–46, though that study is restricted specifically to large corporations. For broader approaches that emphasize the evolutionary character of organizations, see the special volume devoted to "dynamic capabilities," and especially David Teece and Gary Pisano, "The Dynamic Capabilities of Firms: An Introduction," *Industrial and Corporate Change* 3 (1994): 537–56; Giovanni Dosi and L. Marengo, "Some Elements of an Evolutionary Theory of Organizational Competencies," in *Evolutionary Concepts in Contemporary Economics*, ed. Richard W. England (Ann Arbor, Mich., 1994), 157–78; Richard R. Nelson, "Why Do Firms Differ, and How Does It Matter?" *Strategic Management Journal* 12 (1991): 61–74.

were produced.[6] The insights resulting from individual studies of consumer goods producers, however, have yet to be generalized within the history of marketing.[7] No comparable analysis, based on an equivalent distinction between radical and incremental invention and innovation, has been attempted for the non-technical dimensions of product innovation and development for the earlier period. In trying to track the evolutionary process of decision making that affected product innovation, historians have concluded that the cumulative accretion of information was the critical influence on the directions in which the entrepreneurial search for new products has moved.[8] But even in that literature, the primary emphasis has been on technology and production costs rather than on products and product development and the market. The success of firms that manufactured branded, packaged goods in British and overseas markets during the forty years before World War I depended not only on the products that entrepreneurs and managers thought people would buy, but also on consumers' perceptions of those products. Technical and organizational changes affected production, scale, and costs, as did gradually increasing quality control through research and development, but their effects upon the products manufactured by these companies were not dramatic.

Firms and Framework

This article focuses on the products of, and product development within, three British firms that were among the most successful manufacturers of branded, packaged consumer products, household goods, and processed foods during the nineteenth and early twentieth centuries. A particular interest attaches to these companies because of their roles (inadequately explored for two of the three firms) within a growth sector of the British economy that has attracted ap-

6. Maxine Berg, "Product Innovation in Core Consumer Industries in Eighteenth-Century Britain," in *Technological Revolutions in Europe: Historical Perspectives*, ed. Maxine Berg and Kristine Bruland (Baltimore, Md., 1998), 170–89; Louis Galambos, with Jane Eliot Sewell, *Networks of Innovation: Vaccine Development at Merck, Sharp, Dohme, and Mulford, 1895–1995* (New York, 1995).

7. On consumer durables, see especially William J. Abernathy, *The Productivity Dilemma: Roadblock to Innovation in the Automobile Industry* (Baltimore, Md., 1978). On fast-moving consumer goods, see Kathy Peiss, *Hope in a Jar: The Making of America's Beauty Culture* (New York, 1998).

8. C. Knick Harley, "The Shift from Sailing Ships to Steamships, 1850–1890," in *Economic Maturity and Entrepreneurial Decline; British Iron and Steel, 1870–1913*, ed. Donald N. McCloskey (Cambridge Mass., 1973), 215–34.

proving comments from historians otherwise critical of British business between the 1870s and 1939.[9]

Established as a flour miller in Norwich in 1804, in 1814 Jeremiah Colman moved to rural Stoke Holy Cross where he acquired a mustard-making business. Together with nephew James, who became a partner, Colman expanded his production capacity and diversified into starch-making in about 1830. Rapid expansion followed the relocation of the business in the early 1850s to the new, extensive Carrow Works in Norwich, where from 1850 the local river and coastal transport network was extended by railway linkage to the national network. By 1869 the partnership employed 1,100 workers.[10] At that time, the partnership of Isaac Reckitt & Sons, which had been formed as a sole proprietorship manufacturing starch in the port of Hull in 1840, employed fewer than three hundred people.[11] For both, the forty years preceding World War I brought about rapid expansion. By 1913 Reckitt's employed 5,339 workers compared to Colman's 3,228, by that measure placing both among the largest British manufacturing companies.[12] At that time, Colman's was Britain's largest mustard manufacturer; both Colman's and Reckitt's were virtually unchallenged leaders among British starch and washing blue makers. Through product innovation and acquisition, by 1913 Reckitt's was also the leading producer of polishes of all kinds. These years also saw the enterprise of W. H. Lever, formed in 1885, become Britain's biggest soap manufacturer and one of Britain's largest international manufacturing companies. In 1909 Lever employed 5,329 people in Britain alone and many more in the several factories he acquired overseas.[13] Each of the three firms was family-owned, controlled, and managed—in the case of Lever Bros. by the founder-owner—throughout the period.

With the exception of Reckitt's, quantitative data series relating product innovation and development to sales and profitability are lacking. Within the limitations imposed by the weaknesses of the archival sources, we have four objectives in this article. The first is

9. Notably, Chandler, *Scale and Scope*. There are historical links between the companies as two of them, Colman's and Reckitt's, merged in 1938 to form Reckitt & Colman, while Unilever acquired the Colman business in 1995.

10. Helen Caroline Colman, *Jeremiah James Colman: A Memoir* (London, 1905), 228.

11. Basil N. Reckitt, *The History of Reckitt and Sons, Limited* (London, 1951), 99.

12. Census, R 48, Reckitt & Colman Archives, Dansom Lane, Hull [hereafter, R&C]; E. B. Southwell, "Looking Backward," *Carrow Works Magazine* 13 (1920): 50, in Unilever Historical Archives, Port Sunlight [hereafter, UHAPS].

13. David J. Jeremy, "The Enlightened Paternalist in Action; W. Hesketh Lever at Port 'Sunlight' before 1914," *Business History* 33 (1991): 63.

to assemble quantitative evidence, albeit of a limited nature, for each of the firms. The second is to examine the factors that influenced decision makers in the entrepreneurial search for products and the formulation of product and marketing policies in the branded, packaged goods trades before 1914. The third is to explore how the firms tackled product development, whether through internal research and development or by acquisition. Finally, we also consider the relevance of the notion of radical versus incremental change to product rather than to technical innovation.

We base our analysis of product innovation and development in the three firms on a taxonomy developed by the consulting firm Booz, Allen, and Hamilton (BAH) in their study of modern product development in the U.S. consumer goods industries during the 1960s.[14] The employment of a similar schema derived from the BAH study in more recent analyses of product development indicates a continuing interest in this approach among management researchers and business economists.[15] BAH listed categories to describe product innovations ranging from a macro invention to the most minor modification of a product. Our categories are similar, but we have modified the originals to render the research feasible when using historical data stretching back to the nineteenth century, which inevitably fall short of the relative precision claimed for modern survey data. We have devised seven categories plus two subcategories. Category 1 is defined as a "true innovation" (equivalent to the radical or macro invention). Categories 2 through 7, following BAH, move down a scale of diminishing innovativeness in the process of product development. The following are the criteria for classifying products:

1. A product new to the world and creating a new market (for example, the telephone)
2. A product new to the world but for an already existing market (for example, the washing machine)

3a. A product completely new to the company

14. Booz, Allen, and Hamilton, *Management of New Products* (1968; New York, 1982). Because of the limitations of historical data and evidence in relation to product development, a simplification of the original taxonomy devised by BAH took account of modifications introduced by S. Edgett, D. Shipley, and G. Fabs, "Contributing Factors to Success and Failure in New Product Development," *Journal of Product Innovation Management* 9 (1992): 3–10. See Church, "New Perspectives," 429.

15. Edgett, Shipley, and Fabs, "Contributing Factors," 3–10; R. G. Cooper and E. J. Kleinschmidt, "New Products: What Separates Winners from Losers?" *Journal of Product Innovation Management* 4 (1987): 169–84; Cooper and Kleinschmidt, "Major New Products: What Distinguishes the Winners in the Chemical Industry?" *Journal of Product Innovation Management* 10 (1993): 90–111.

3b. A product completely new to the company but also offering new features compared with the products of competitors in an existing market
4. A new product line for a company competing in an existing market (for example, a liquid instead of a powder form)
5a. A new item in a company's existing product line sold in an existing market (for example, a brand or flavor of drink)
5b. As above, with significant features (for example, disinfectant soap)
6. A significant modification of an existing product within the company's range (for example, a type of dispenser)
7. A minor modification of a company's existing product (for example, size, shape, color, or packaging)

The categories are, to some extent, arbitrary, and the allocation of products into each is inevitably a matter of judgment. Nonetheless, we consider this to provide at least a useful starting point for a systematic analysis of the kinds of product development undertaken, how and why, and with what effects. Clearly, it is difficult to discern the characteristics distinguishing between products placed in consecutive categories 3a or 3b, and 5a, 5b, or 6, and for that reason, the differences between them render generalization tentative. On the other hand, the substantial differences in the criteria that separate categories 1 to 3 from 6 to 7 ensure that wide differences can be captured by this system.

The Trade in Household Goods before 1870: Product Innovation and Competition

With the exception of the mustard trade, which at the beginning of the period was dominated by two firms, Colman's of Norwich and Keen's of London, each of the three firms examined here supplied its manufactured products (starch, blue, polish, and soap) to local and regional markets. Early in the nineteenth century, the trade in these consumer goods had been dominated by London firms, which were located at the nation's largest concentration of effective demand for such products—primarily among the middle classes. From the mid-nineteenth century, that metropolitan dominance declined.[16] Technical change (which affected soap production in particular),

16. On starch and blue, see Brian W. Peckham, "Technological Change in the British and French Starch Industries, 1750–1850," *Technology and Culture* 27 (1986): 18–39. On soap, see Charles Wilson, *The History of Unilever: A Study in Economic Growth and Social Change* (London, 1954), 1: chap. 1.

transport developments, and reductions and removal of excise taxes contributed to the growth of market potential in the industrializing regions of the north and midlands. In the case of starch and blue, the repeal of detailed government regulation, which had favored the large London starch makers, was a further factor conducive to changes in market structure. Initially, the opening up of these trades by the influx of new entrants created local and regional markets. From the mid-nineteenth century, an overall increase in demand was one of the consequences of rising living standards. A growing concern for cleanliness, associated with health and with fashion in the form of whiteness for clothing items and linen, easily translated into widespread consumption, even as the low cost of soap, starch, and blue enabled their definition both as household necessities and as inputs to an expanding laundry industry.[17] The efforts of producers' associations to limit competition, inter- and intra-regionally, were only intermittently effective, and in fact intra- and inter-regional competition increased from the 1880s.

The response of the larger companies was to expand output and to acquire smaller price-cutting competitors. This process saw the emergence of Colman's as a virtual monopolist in the domestic mustard trade. By 1914 Lever Bros. produced almost half the soap used in the United Kingdom and faced only two serious competitors, Crosfield's and Gossage's. Acquisitions and product development enabled Reckitt's to share, with Colman's, dominance in the starch and blue trades in Britain from the 1890s. The acquisition by Colman's of the long-established London starch makers Orlando Jones & Co. (in 1901) and Keen, Robinson & Co. (in 1903) resulted in Colman's and Reckitt's accounting for roughly 50 percent of an aggregate starch output of about £950,000. The next four largest firms supplied about 25 percent.[18] Collusion on prices, production, and competition occurred throughout most of the period, agreements becoming increasingly formal and culminating in 1908 in the formation of a Starch Association that also included Continental firms.[19]

A "live and let live" policy in the conduct of overseas trade led to the formation of Atlantis, a joint company established by Colman's and Reckitt's in 1913 to formalize collusion in their trade with South America. A series of acquisitions between 1900 and 1914 was the basis of Reckitt's leadership in the trade in blue, with that company

17. Roy Church and Christine Clark, "Cleanliness Next to Godliness: Christians in Victorian Business," *Business and Economic History* 28 (1999): 27–41.

18. Starch correspondence, 1905, R 298, R&C.

19. Berger to Ferens, 11 Oct. 1896, R 296; Ferens to Francis, 21 March 1901, R 192; Starch correspondence, Ferens to Francis, 3 July 1980, R 298, R&C.

probably accounting for about one-third of an estimated £323,000 total blue output in Britain in 1905 and increasing its share through acquisitions by 1914.[20] Reckitt's simultaneously engaged in a similar spurt of acquiring smaller innovators and competitors in the polish trade, culminating in the formation of a joint manufacturing company with the remaining rival polish producer, the London firm of Masons, in 1912.[21]

The intensification of competition from European and American manufacturers of starch, blue, and soap provided a further spur to the owners and managers of these entrepreneurial family firms to consolidate the trades in Britain. This process included acquisition and price agreements, initially among British firms, in order to strengthen negotiating positions in agreements with Continental and American firms operating through agencies and franchises in Britain. Added to the similarities in the competitive process in each of the trades was a common pattern of distribution through wholesale and retail grocers. The interests of the wholesalers and retailers influenced these firms' decisions regarding product diversification.

Throughout this period, technical and organizational change affected production, scale, and costs, though markedly only in the case of soap. The qualities of the products in use depended primarily on formulas and the blending of compounds. Quality control through research and development began to assume increasing importance as the scale of production expanded, and the recruitment of knowledgeable employees from competitors and the employment of German chemists were favored tactics for quickly acquiring the necessary expertise.[22] New entrants and the survival of small enterprises are indicative of low barriers to entry. Because of the nature of these para-chemical enterprises, patents were difficult to defend unless associated with a distinctive trademark. Patents registered for starch, blue, and polish applied either to variations in composition that affected coloring and shape (for example, blocks, squares, or diamonds) or applicators (containers and dispensers). Much more common, even before the Trade Marks Act of 1876, was the registration of trademarks for each "new" product. Infringement by imitation of

20. Retailers base these highly tentative "guesstimates" on a contemporary estimate that starch sales were roughly three times as large as those of blue. Ferens to Francis, 15 March, 1899, R 229, R&C. The figure for Colman's starch sales (£237,150 and that for Reckitt (£204,427) are from the same source. Reckitt's blue sales are from J. B. Upton, "Record of UK Sales by Product, 1861–1954," R 25, R&C.

21. Reckitt, *History*, 50–56.

22. Isaac to George, 23 April 1873, R 8, R&C; Reckitt, *History*, 41–42.

the names and images appearing on packaging and featured in advertising elicited threats of legal proceedings against competitors.[23]

An important factor in product innovation and development in both the Colman and Reckitt enterprises during the early nineteenth century was the founders' familiarity with the milling process and with the grain markets of eastern England. A flour miller until 1814, Jeremiah Colman then acquired a mill that made mustard as well as flour. After the formation of a partnership, which included three of Jeremiah's young nephews, the company added starch production to the product line in 1830. Thereafter, the substitution of rice for wheat (a process patented by the London accountant Orlando Jones in 1840) and variations in the qualities of starches for different purposes further extended the product range. The production of washing blue for whitening starch commenced in 1852, following a period during which blue had been supplied to Colman's by a Bristol blue maker and advertised together with Colman's starch.[24]

Like Colman's, the enterprise established by Isaac Reckitt in 1840 developed into one of the largest manufacturers of starch and blue during the succeeding decades. Another similarity was the founder's progression from flour milling to starch production, though in Reckitt's case this journey had included three business failures. Mustard was Colman's main product, cushioning the partners from the intense competition in the newly deregulated starch industry during the 1840s and 1850s, whereas Isaac Reckitt and (from 1848) his nephew partners possessed no such cushion, and the business was unprofitable between 1840 and 1847.[25] The partners' plans to remedy this lack of success were twofold. One was to develop a starch sufficiently distinctive to justify marketing through traveling salesmen and advertising in order to penetrate competitors' markets; the second was to add products other than starch that would increase turnover and spread the costs of marketing.

Soluble, and later crystalline, starch, developed by Frederic Reckitt in trial-and-error experiments using farina (potato flour) or sago

23. For example Isaac re infringement 9 July 1877 and 28 Nov. 1878, R 9; Board Minute Book, 10 Jan., 10 March 1882, 11 Jan. 1888, R 141; Directors' Minute Book, 11 Oct., Dec.1890, R 290; Directors' Minute Book, 10 Aug. 1894, R 14; Directors' Minute Book, 6 Dec. 1896, R 213; all R&C; E. Chicken, "Ultramarine: A Study" (Ph.D. dissertation, Open University, 1993), 192, appendix 6.

24. E. B. Southwell, "J. & J. Colman, Ltd. Early Days at Stoke Holy Cross," *Carrow Works Magazine* 19 (Oct. 1925): 3.

25. Basil Reckitt, "Notes on the Reckitt's Early Family History" (1948), Appendix VII, George Reckitt's "Statement" (1860s), Basil Reckitt Family Papers (privately held) [hereafter, BRFP].

(sago palm flour) rather than wheat were the results of the search for novelty in the firm's existing markets. So too was a new patented "wheaten" starch, which Isaac described as being of "a more dazzling whiteness than anything yet produced."[26] These products enabled the partnership to survive and grow, albeit modestly. The number of starch product lines increased during the 1850s, but the next substantial change in that line did not occur until 1864, with the introduction of rice starch. Though directly related to the trade in starch, blue was the first successful new product; introduced for sale in 1852, Reckitt's Laundry Blue was manufactured from ultramarine imported from the Continent.[27] The partners explored the market potential of adding more grocery lines for the traveling Reckitts to sell on commission, and between 1853 and 1858 they sold chicory and matches imported from Holland.

Biscuit manufacture, begun in 1857, accounted for roughly two-thirds of the partnership's total turnover within six years.[28] Profit on the biscuit trade was negligible, however, and when fire destroyed the factory in 1866 the partners decided not to rebuild, selling the goodwill of the business to Peek Frean & Co. at a premium.[29] By contrast, the introduction of black lead in 1852, initially purchased as a finished product from de Beer's for use as stove polish, marked the beginning of a major new product line. Following an exclusive agency agreement with a German mine, which guaranteed supplies of high-quality black lead, the Reckitts embarked upon manufacture in 1855. Unlike the biscuit trade, sales grew very slowly, and an advertising campaign directed at grocers, urging them to sell Reckitt's "Diamond Black Lead," was begun in 1862.[30] By 1870 annual starch sales reached £22,812, blue reached £11,363 (and £3,774 for "loose blue"), and £5,508 for black lead.[31] The production of blue and blacking was similar to starch production, in the sense that they all involved relatively simple chemical processes, but grocers distributed each of the products produced by Colman's and Reckitt's in a context of intense competition. In the later period, too, distribution was of continuing importance, influencing the patterns of product development in the two firms.

26. Isaac to George, 10 Oct. 1849, BRFP, vol. 2.
27. Reckitt, *History*, 22.
28. Ledger f16, R 2, R&C; Reckitt, *History*, 30–31.
29. Desmond Chapman-Huston, *Sir James Reckitt, a Memoir by Major Desmond Chapman-Huston (Desmond Mountjoy)* (London, 1927), 171–72; Reckitt, *History,* 32.
30. Isaac to George, 12 Jan. 1863, BRFP, vol. 4.
31. Ledger f28, R 2, R&C.

Applying the BAH scheme to the earlier nineteenth-century histories of the two firms reveals that none of the developments fell into category 1 and only one into category 2. This was Colman's "medical mustard bran," a by-product thought in 1868 to offer the basis for developing a trade in essential oil of mustard sold through chemists and druggists, though investigation of potential market size dictated limited development.[32] Of the five innovations in category 3, two occurred when Jeremiah Colman entered the mustard trade in 1804 and two of the other three when he began to manufacture starch and to trade in blue. Of twenty-seven innovations from the time the two firms commenced starch production, five were category 4 and, except for a single 7, the remainder were category 5. This was a stage in both Colman's and Reckitt's histories when they were strengthening their position in the grocery trade by assiduous attention to the interests of wholesalers and retailers, and it was accompanied by policies of limited product diversification.

Product Innovation, Product Development, and Emerging Dominance, 1870–1914

For the period 1870 to 1914, we identified an aggregate sixty-two product innovations for the three enterprises (see Table 1). We present detailed breakdowns showing the categorization of each product for each firm separately in Tables 2, 3, and 4. As in the early history of the companies, the pattern underlines the continued major importance of marginal adaptation of products as the main form of competition in the markets for consumer goods.

Trading in a market with products supplied by another manufacturer was infrequent, though this was the route by which the Reckitts had diversified into blue and blacking manufacture for sale to grocers in the previous decades. This was also the method by which Lever's "Pure Honey Soap" came to be on sale in the Bolton grocery store in 1874, two years after William H. Lever became a partner in his father's firm. The same was true of "Sunlight Soap," which was supplied initially to the Levers' groceries by northern soap manufacturers in 1884, before Lever himself commenced production.[33] "Sunlight Self-Washer" Soap was distinctive in that it was made with oils rather than tallow. It possessed unusually good lathering properties,

32. E. B. Southwell, "J. & J. Colman Ltd.: Early Days at Carrow up to 1874," *Carrow Works Magazine* 19 (July 1926): 95.

33. Wilson, *History of Unilever*, 1: 27–28.

Table 1 Products by Category: Colman's, Reckitt's, Lever Brothers, 1870–1914

Category	Colman's	Reckitt's	Lever Bros.	Total
1	0	0	0	0
2	0	0	0	0
3a	7	0	1	8
3b	0	0	3	3
4	1	1	2	4
5a	14	10	14	38
5b	0	2	2	4
6	1	1	1	3
7	1	0	1	2
Total	24	14	24	62

Source: Compiled by authors, using modified categories from Booz, Allen, and Hamilton, *Management of New Products* (1968; New York, 1982).

Table 2 J. & J. Colman, Product Developments, 1870–1914

Product	Date of Launch	Rating	How Developed
Synapism (Mustard leaves)	c1870	5a	D
Azure Square Blue	1872	5a	D
Ultramarine Ball Blue	1872	5a	D
Windsor Ball Blue	1872	5a	D
No. 1 Azure Blue	1875	7	D
Mustard Oil	1886	5a	D
Swan Starch	c1885	5a	D
Starch for Paper Makers	1887	5a	D
Bath Mustard	c1890	5a	D
Semolina	c1890	5a	D
Self-Rising Flour	c1892	5a	D
Savora Relish	1899	5a	D
Fairy Glaze Starch	1900	5a	A
Flag Starch	1902	5a	P
Patent Barley	1903	3a	A
Patent Groats	1903	3a	A
Waverley Oats	1903	3a	A
Spices	1903	3a	A
Ready Mixed Mustard	1907	6	D
DSF Relish	1910	5a	D
Poultry Mustard	1911	4	D
Dried Peas	1912	3a	A
Custard Powder	1912	3a	A
Ketchups and Sauces	1912	3a	A

Key: A = acquisition of company; P = purchase or patent rights; D = developed internally.

Sources: Unilever Historical Archives; *Carrow Works Magazine*; *The Advertising of J. & J. Colman: Yellow, White and Blue* (Norwich, 1977).

Table 3 Reckitt & Sons, Product Developments, 1870–1914

Product	Date of Launch	Rating	How Developed
Paris Blue	1873	5a	D
Crown Blue	1873	5a	D
Zebra Grate Polish	1890	5a	D
Bag Blue	1890	6	D + P
Zebra Paste Enamel Grate Polish	1893	5b	D
Robin Starch	1899	5b	P + D
Enameline Paste Grate Polish	1903	5a	A
Dome Lead Polish	1904	5a	A
Brasso Metal Polish	1905	4	D
Bluebell Metal Polish	1908	5a	A
Shinio Metal Polish	1909	5a	A
Mepo Metal Polish	1911	5a	A
Master Boot Polish	1912	5a	D + A
Silvo Silver Polish	1913	5a	D

Key: A = acquisition of company; P = purchase or patent rights; D = developed internally.

Source: Reckitt & Colman Archives, Dansom Lane, Hull, U.K.

but its composition caused "sweating" and rancid odors when the soap was exposed to the open air. These disadvantages led Lever to packaging innovations that were crucial not only to the commercial success of the Sunlight line, but also to the company's overall growth.[34] Although these innovations were important for the two companies in the long term, their character emphasizes the commercial, rather than technological, basis of their success. They were neither new-to-the-world products nor aimed at completely new markets.

Internal development was the source of the greatest number of product innovations by far (see the "how developed" columns in Tables 2, 3, and 4), though beginning in 1897 Lever began to acquire other companies in order to add to its product lines. In 1900 Colman acquired Rosga Starch, a small Birmingham company that made "Fairy Glaze," in order to compete with Reckitt's highly successful composite "Robin Starch," launched the year before. Based initially on a new German "double starch" containing borax, the special selling point of Fairy Glaze was that it enabled the iron to glide smoothly over linen.[35] From 1903 Reckitt, too, initially supplemented its internal development of stove polish by acquiring competing producers of the new metal polishes.

34. Ibid., 28–30.
35. Reckitt, *History*, 49.

Table 4 Lever Brothers, Product Developments, 1870–1914

Product	Date of Launch	Rating	How Developed
Lever's Pure Honey Soap	1874	3b	T
Sunlight Bar Soaps	1884	5a	T
Sunlight 'Self-washer' Soap	1884	5b	D
Sunlight Soap in Cartons	1886	6	D
Lifebuoy Soap	1894	5b	D
Welcome Soap	1897	5a	A
Toilet Soap	1898	3b	NK
Monkey Brand Soap	1899	4	A
Sunlight Flakes	1899	3a	D
Lux Flakes	1900	7	D
Carbolic Dry Soap Powder	c1900	5a	D
Velvet Skin Soap	1902	5a	K
Plantol Toilet Soap	1903	5a	D
YZ Royal Disinfectant Soap Powder	1903	5a	D
Limelight Candles	1903	3b	NK
Refined Monkey Brand Toilet Soap	c1903	5a	A + D
Vim Scouring Powder	1904	4	D
Coral Toilet Soap	c1905	5a	D
Opera Toilet Soap	c1905	5a	D
Cedar Toilet Soap	c1905	5a	D
Zulu Toilet Soap	c1905	5a	D
Comfort Soap	1906	5a	A
Omo Soap Powder	1909	5a	A
Rinso Soap Powder	1910	5a	D

Key: A = acquisition of company; D = developed internally; T = trading (buying and reselling); NK = not known.

Source: Unilever Historical Archives; Charles Wilson, *The History of Unilever: A Study in Economic Growth and Social Change*, 3 vols. (London, 1954, 1968), vol. 1.

Products, Policy, and Processes: The Case of Colman's

Before the 1890s, details of the processes by which product development occurred are sparse. It was the practice of the Colman partners to consult with the starch house manager before making changes. Experiments with the production of colored starches in the 1860s resulted in only two successful tints, buff and ecru. Reports in the 1860s and again in the 1880s concerning exploration of the market for a trade in mustard oil, in the form of sinapisms (mustard plasters) and concentrate, for health purposes did not indicate a substantial potential.[36] Self-rising flour was introduced in 1892; "Savora," the first ready-made mustard, appeared in 1899, and poultry and bath mustards in 1909 and 1911. Thus, development occurred along a tra-

36. Southwell, "J. & J. Colman: Early Days at Carrow," 93–100.

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Sunlight Soap was originally not a single product, but a line of soaps upon which W. H. Lever imposed a brand, hoping to suggest to consumers a consistent high quality. After he went into the soap business himself, he continued to use the "Sunlight" brand for a series of specialty soaps the company developed. Image reproduced with the kind permission of Lever Fabergé and Unilever Historical Archives.

jectory, the starting points for which were the existing product base and the self-imposed constraints of the established channels of distribution. Colman's employed their first graduate chemist (from Owens College) sometime before 1914, primarily for the purpose of quality control.[37]

Although the actual process of product development remains obscure at Colman's, the source of ideas about product strategy is clear. The partners and managers ultimately made decisions, but their intelligence originated primarily from the commercial travelers they employed. By 1882 a Statistical Department, which monitored home and overseas sales, was providing support for the annual meeting of travelers, where each year's trading results and sales comparisons over time were presented. Divided into three groups, "Seniors, Northern, and Southern," the travelers met for two days, during

37. J. H. Mottram, "History of J. & J. Colman and J. & J. Colman Ltd of Carrow and Cannon Street" (unpublished typescript ca.1950), 104.

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Colman's from the beginning concentrated on a few products in which it excelled, and the company was noted for its mustard and flours as well as starch. It was in fact overtaken by Reckitt's as the leading starch maker when the latter firm introduced the rice-based Robin Starch in 1899. Image reproduced with the kind permission of Van den Bergh Foods and Unilever Historical Archives.

which, according to a senior contemporary manager, the discussions held were "prolific in suggestions . . . which cannot but be good for allied businesses."[38] The formation in 1903 of an "Inner Circle," consisting initially of four senior travelers, became a forum for the discussion of marketing strategy generally. Directors consulted with this

38. E. B. Southwell letter book, 22 Dec. 1903, J. & J. Colman Collection, UHAPS.

group frequently about products, packaging, prices, and advertising. However, despite the importance attached to the trade in food and household goods, the advertising manager was not included in these discussions. Not surprisingly, he was critical of the lack of integration into an overall selling organization. In his view, "The representative staff should be in touch with the heads of the advertising department—nothing is so helpful to advertising men as the reports and conversations with the firm's representatives."[39]

Several acquisitions were made to eliminate competition from other starch, blue, and mustard manufacturers, particulary the long-established and formerly illustrious London starch business of Orlando Jones & Co. (in 1901) and mustard makers Barringer Wallis & Manners and Moss Rimmington & Company (in 1910). By that time it is clear that E. B. Southwell, Colman's general manager, had become a key decision maker regarding product development. For example, noting the rapid growth in grocers' trade in polishes, one of Colman's sales representatives suggested to Southwell that the company should diversify into that line. Southwell's negative response reveals the two principles that underlay product policy. One was to avoid retaliatory action from Reckitt (by that time a leading producer of polishes), which was already an effective competitor challenging for leadership in the starch and blue trades and which the Colmans feared might enter the mustard trade. The other was the historic experience at Carrow, whereby "the directors have always acted upon the principle that it is well for the shoemaker to stick to his last and concentrate effort and capital on our specialties."[40] Southwell's justifications for spurning proposals for "auxiliary schemes" (diversification) were based on his experience of the firm's failed projects, which included a paper mill, a farm, and the Sandy Acre Wheat Starch business.[41]

Nevertheless, some diversification occurred despite this policy. Keen Robinson & Co. was acquired in 1903 to lessen competition in the mustard trade. As the manufacturer of Robinson's Patent Barley and Robinson's Patent Groats in addition to mustard and other spices, that company was also the largest manufacturer of baby food in Britain.[42] Having considered but rejected entry into the health-related trade, the Colmans proceeded to develop trade in soft drinks and baby foods, which became increasingly important markets. Similarly, in 1912, as a result of acquiring Farrows, a small but rapidly

39. Ibid., 4 May 1904.
40. Ibid., 19 Sept. 1912.
41. Mottram, "History of J. & J. Colman," 111.
42. Ibid., 106.

growing business that had been making inroads into Colman's mustard trade through aggressive advertising, Colman's packaged product range expanded further to included mushroom-ketchup and dried peas. The products thus acquired, subsidiary to the principal objectives of those takeovers, were to have significant unintended consequences for the company after 1914.

The Process of Product Diversification at Reckitt's

Product development in the Reckitt partnership depended heavily on the ideas and experiments conducted by Frederic Reckitt who, until the 1880s, was responsible for all tests relating to the improvement and manufacture of products.[43] A lecturer in chemistry at the Royal Institute in Hull was engaged to work as a consultant on the manufacture of black lead, but it was not until 1894 that the firm appointed a qualified chemist, Edward Elliott, who had lived in Germany and was fluent in German, on a full-time basis.[44] Initially, his responsibilities were to take charge of starch production and to test raw materials, but within two years the appointment of two assistants released him for experimental work, which included the application of borax and bicarbonate to starch production.[45] In 1899 he revisited Germany to learn from a chemist previously employed by Hoffman's, the leading German starch maker.[46] By 1900 the company had appointed four more chemists, including two for the ultramarine blue factory at Stoneferry, which in 1884 began production both for internal use and for sale. This venture was developed with German technical expertise, and a succession of German chemists were appointed between 1884 and 1899.[47] Research on carbon black at the Kingston works to develop an improved grate polish was the responsibility of another chemist. Reckitt's managing director, T. R. Ferens, emphasized the need for conducting "purely research work and saving of by-products," for which purpose Dr. John Harger was appointed in 1899. By 1909 Reckitt's factories and laboratories employed between twelve and sixteen chemists.[48]

43. Chapman-Huston, *Sir James Reckitt, a Memoir*, 109.
44. Ferens letter book, 4 May 1894, R 290, R&C.
45. Ibid., 2 July 1895.
46. Chicken, "Ultramarine: A Case Study," 184.
47. Reckitt, *History*, 41–42.
48. Census 17 Dec. 1909, R 48; Directors' minute book 1A, 8 May 1901, R 214, R&C. Dr. John Harger's initial salary was £250, increasing to £300 once the company was successfully manufacturing carbon black. From 1908 he received a retainer of £200 for ten years to act as consulting chemist (3 April 1901); Directors' minute book no. 3, 2 July 1908, R 216, R&C.

The diversification of Reckitt's product range between 1870 and 1913 had its origins in the middle decades of the century. Table 5, which shows Reckitt's sales by product, illustrates the outcome. In 1870 starch was the largest income producer, then washing blue, followed by black lead polish. The changes apparent by 1913 are primarily a direct consequence of the effect of competition and the success or otherwise of the Reckitts' overall marketing strategy. Soluble starch, made from wheat in 1844, had given the partners an initial novelty. In 1847 sago starch also sold well, in part because of the low price of sago flour, which in the new recipe substituted for expensive potatoes.[49] Starting from these basic starches (in addition to the "dazzling whiteness" offered by the Patent Soluble Starch favored by Nottingham lace finishers), Frederic's experiments produced a range for different markets: the traditional powder starch (which required boiling); double-refined blue (whitened) wheaten starch, which was popular in the southeast of England; sago starch; and wheaten starch powder, used by perfumiers and lozenge makers. Rice starch was introduced in the 1860s and initially sold to paper makers, but it subsequently became a major line. The 1872 Food Adulteration Act, which the Reckitts attempted to bypass by renaming the product sago root and selling it without labels, threatened the market for Dietetic Arrowroot made from sago.[50]

A similar process of experimentation to extend product range followed the success of the blue trade. Manufactured from ultramarine, blue was originally used as a whitener for starch.[51] Production began on a small scale in the early 1850s when washing blue, made from imported ultramarine, was sold as "Ball Blue" (describing the shape). By the 1870s, in addition to several sorts of Ball Blue (varying in shade), the Reckitts were selling two powder blues and "Crown Blue," sold in home and overseas markets.[52] Reckitt's wrapped "Square Blue" was an innovation that other makers (including Colman's) began to copy. However, the Reckitts expressed confidence that the quality of the blue gave the product a readily recognizable identity and provided the firm an unassailable position in the market.[53] Branded and heavily advertised as "Paris Blue," this "new" square blue in wrappers introduced in 1873 was largely responsible for the increase in Reckitt's blue sales from barely £40,000 to £70,000 in

49. This is thought to be based on a recipe that Isaac had obtained in settlement of a debt some years before. Reckitt, *History*, 8, 23.

50. Ferens' copying book, 17, 26 Sept. 1872, R 8, R&C.

51. Chicken, "Ultramarine: A Case Study."

52. Chapman-Huston, *Sir James Reckitt, a Memoir*, 114, 164, 170; Ferens' copying book, 22 Nov., 31 Dec. 1873, R 8, R&C.

53. Ferens' copying book, 24 Jan. 1873, 10 Oct. 1874, R 8, R&C.

Table 5 Reckitt & Sons, U.K. Home Sales, by Product/Category, 1861–1914

	Sales Total (£)	Starch as % of Sales	Blue as % of Sales	Ultramarine as % of Sales	Sundries as % of Sales	Tints as % of Sales	Lead as % of Sales	Metal Polish as % of Sales	Silvo as % of Sales	Total
1861	21,742	42.74	34.45	—	2.64	—	20.17	—	—	100
1866	26,083	35.20	28.18	—	1.39	—	35.22	—	—	100
1871	46,887	51.33	28.95	—	0.71	—	19.02	—	—	100
1876	72,778	30.95	58.44	—	—	—	10.61	—	—	100
1881	89,384	32.68	57.72	—	1.41	—	8.19	—	—	100
1886	118,521	25.45	61.26	—	0.47	—	12.82	—	—	100
1891	147,087	25.07	53.60	—	1.00	—	20.33	—	—	100
1896	226,573	29.36	41.27	—	1.02	—	28.34	—	—	100
1901	426,854	40.55	22.90	0.37	0.96	—	35.22	—	—	100
1906	564,685	30.73	19.68	0.38	0.83	0.71	44.69	2.97	—	100
1911	828,702	21.22	13.80	0.54	0.80	0.70	43.10	19.84	—	100
1914	1,137,709	17.56	14.48	0.50	0.61	0.23	30.72	35.57	0.34	100

*After 1906, figures for sundries, "Brasso," and tints are aggregate; to reveal the rapid growth of metal polish sales, we use a constant for sundries and tints.

Source: J. B. Upton, "UK sales by product, 1861–1954" R 25, Reckitt & Colman Archives, Dansom Lane, Hull, U.K.

1885 and attracted several would-be infringers. Also successful was the introduction of blue ("of the same quality as . . . Paris Blue") packed in flannel bags in imitation of the bag blue originally patented by Edge, a small-scale competitor in the north of England. After a period of competition with Edge in northern cities during which Reckitt's sold blue in unmarked bags, in 1890 the firm purchased Edge's rights for five years and launched "Reckitt's Bag Blue." Labeled with the distinctive registered Reckitt's stripes, "Bag Blue" was first introduced in the Australian market, then the British. At the same time, the Reckitts successfully opposed Edge's attempt to register the bag itself as a trademark.[54]

Competition in the starch trade also intensified. Reckitt's experimented with the production of rice starch as a method of lowering costs. Simultaneously, the Colmans, whose firm had manufactured rice starch since 1850 with some success, intensified its efforts to develop this market. In 1873 they acquired rice starch maker Hickham, Dixon & Co. This was a small firm, but Dixon previously had been employed by Bergers, one of the large London rice starch makers.[55] Reckitt's experiments began in 1864 but encountered difficulties in achieving consistency and satisfactory quality, and it was not until 1899 that the firm achieved a significant breakthrough.[56] That success originated with a commission agent who was the British distributor of a German product, Mack's "Double Composite Starch," whose commercial success rested on the distinctive quality derived from a borax-rice formula usable in cold or hot water. Reckitt acquired the formula, trademark, and a guarantee of a year's supply of Mack's starch for £10,500.

The Reckitts proceeded to pioneer the new rice starch in 1899 under the trademark "Robin Starch," a name suggested by Sir James Reckitt, the company chairman.[57] The name, which made the robin image an obvious choice for the company's advertising, met Ferens' requirement that it should be "a happy name with which we could associate a good [trade] mark—a great advantage."[58] The marketing strategy adopted promoted the product as resolving the problems arising from users' having to guess the strength of the solution required. Sold in powder form rather than in a block and packaged in

54. Minute Book, 10 April, 21 May, 1889, 18 April 1890, R 14; Ferens to James, 12 April 1890, R 290, R&C.

55. Ferens' copying book, 23 April 1873, R 8, R&C.

56. Ibid., 28 June 1873.

57. Ferens' letter book, 17 May 1897, R 291; Minutes of directors' committee meetings no. 2, 10 March 1899, R 249; Ferens' letterbook, 28 March 1901, R 293; all R&C.

58. Ferens' letter book, 31 Jan. 1899, R 291, R&C.

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The packaging of laundry whitener ("blue") in bags became a successful marketing strategy by Reckitt's, who launched their own bagged product after noting the success of a competitor—who tried, but failed, to trademark the use of a bag itself. This advertisement, mentioning a Sydney location, reflects the company's test-marketing of the product in Australia. Image reproduced with the kind permission of Reckitt Benckiser plc.

flat envelopes with bold blue stripes, Robin Starch supplied instructions to the user specifying the volume of water required.[59] Within three years, Robin Starch accounted for roughly two-thirds of the company's starch sales (see Table 5) and 27 percent of its total turnover (the declining proportion of starch sales is explained by the rapid success of Reckitt's polishes).[60]

Experiments to improve other starches continued: for example, in 1902 the object was to develop a "novel, cheap, thin boiling starch." However, the years shortly before World War I also witnessed product-stretching—that is, claiming additional uses for starch in order to reposition the product. In 1911 Robin Starch advertised as a toilet (talcum) powder found favor through Reckitt's Australian branch.[61] Marketed as "Robin Toilet Powder," the perfumed starch was introduced into the home market in 1913.[62] The outbreak of war in 1914 provided an opportunity for tapping into another market. Reckitt's sought official permission to distribute free samples of the powdered starch to the troops stationed at Aldershot, "as it is an excellent dusting powder for marching."[63]

Packaging was an important basis for competition, beginning with the bull's head logo introduced to advertise Colman's mustard in 1855. The Reckitts, too, used distinctive wrappers for "Square Blue," and in the 1870s they were the first to pack starch in "picture" boxes, an innovation taken up by the Colmans in 1881.[64] By 1886 several other makers were reportedly selling starch in no-name fancy boxes at low prices. For a time, the Reckitts continued to rely primarily on branded starches, securely and attractively wrapped and supported by advertising and promotions. Simultaneously, however, non-price competition took place alongside price agreements with other starch makers, with whom a "rearrangement" of prices favorable to Reckitt's prompted expansion of capacity in anticipation of increased demand.[65]

The spectacular success of Paris Blue during the 1870s had resulted in increased purchase of ultramarine, much of it imported from the Continent. With a view to securing reliable supplies and greater control, in 1882 Reckitt formed a subsidiary company for the

59. Ibid., 27 Jan., 18 May 1898.
60. Upton, "Record of UK sales."
61. Board minute book no. 4, 1 June 1911, R 217, R&C.
62. Ibid., 5 Dec. 1913, 13 March 1914.
63. Board minute book no. 5, 4 Sept. 1914, R 218, R&C.
64. Reckitt, *History*, 40; Ferens' copying book, 16 Aug. 1881, 16 May 1882, R 15, R&C.
65. Board meeting minute book, 11 Nov. 1881, 10 Feb, 14 Aug. 1882, 14 July 1886, R 141, R&C.

production of blue ultramarine, investing £15,000 in plant. Plant construction and the chemical expertise to commence production were supplied by Johannes Egestoft, who supervised the early stages on a £3,000 annual contract. Advice from German chemists, employed either as consultants or as supervisors, continued to be an important source of product improvements throughout the 1890s.[66]

In 1880 Reckitt's marketed "Circular Blue," wrapped as penny "Square Blue" but of lower quality and cheaper than Paris Blue.[67] This was a sign of intensifying competition. Ripley's, which was the dominant firm in the northern region, cut the price of its "Circular Blue" in Liverpool and Leeds, to which Reckitt's responded with further cuts.[68] Intensifying this price and non-price competition, another blue manufacturer in the north, Edge, introduced "Edge's Bagged Blue." Packed in flannel bags, this novel product immediately attracted growing sales. Edge claimed patent protection for its bagged format, a claim ignored by Reckitt's, which in 1886 proceeded to market a bagged starch of a weight identical to that sold by Edge but at a lower price—and initially without Reckitt's name.[69] Three years later, the higher quality, more expensive Paris Blue was packaged in striped calico bags bearing Reckitt's name; as described earlier, Reckitt's "Bag Blue" was test-marketed in New South Wales before entering into direct competition with Edge in the north of England in 1894. By 1905 Bag Blue accounted for one-fifth of Reckitt's blue sales.[70] Meanwhile, lengthy negotiations began whereby Reckitt would acquire Edge's business and bring an end to "the battle of the blues."[71] Competition continued nonetheless, not least because the Reckitts' attempt to buy out Ripley, the last of the British blue competitors apart from Colman's, fell short of Ripley's asking price of £30,000.[72]

Thus, product changes in starch and blue were undertaken to meet competition or in response to specific regional market demand. For example, the directors agreed in 1908 to soften the recipe for bag blue for the Belgian market "until we get what pleases the consumers."[73] Perfumed bag blue was market-tested in Gothenberg and

66. Ibid., 1 Feb. 1888; Chicken, "Ultramarine: A Case Study," 169–76, 184.
67. Board meeting minute book, 10 Nov. 1880, R. 141, R&C.
68. Ferens' copying book, 29 March 1883, R 15; Board meeting minute book, 13 Dec. 1883, R 141, R&C.
69. Board meeting minute book, 8 Dec. 1886, R 141, R&C.
70. Ibid., 8 Dec. 1886, 10 April 1889, 4 Dec. 1894.
71. Ibid., 8 Dec. 1884, 10 April 1889.
72. Ibid., 20 April 1887; Ferens' letterbook, 20 Feb. 1896, R 291, R&C.
73. Directors' minute book no. 3, 6 June 1908, R 216, R&C.

Stockholm in 1903 and introduced in Germany four years later.[74] In the United States, failure to acquire an American company to manufacture and distribute blue led Reckitt's to enter the market with a new "Bluebird Bag Blue," which was similar to an American product already on the market that was softer in texture after first use than blues in Britain and was offered in bags of a comparable size and price. Similarly, Reckitt's chemists developed a liquid blue, which promised 40 percent profit from the selling price, to compete with the American "Bluo."[75]

The United States was also the source of Reckitt's emergence as a major black lead producer during the late nineteenth century. Frederic's experiments had enabled the partners to enter the trade in black lead grate polish in the 1850s, thereby adding an item to the product range that could be sold through grocers already handling Reckitt's starch. Although the market for black lead expanded in the 1860s, difficulties in securing raw materials and distribution problems had constrained growth after the launch of Reckitt's Diamond Black Lead.[76] The turning point came in 1891 when the company introduced a new black lead polish, developed initially by Morse Brothers in the United States and imported into Britain beginning in 1881. By 1890 "Rising Sun" was rapidly expanding its share of the British market. Made from finely milled Ceylon lead (plumbago, or graphite), the polish was extra soft, greasy to touch, and rapidly effective.

With the help of an "informer," the Reckitt factory replicated the Americans' production method in preparation for an attack on the Morses' position both in New York and in Britain. They regarded naming the new grate polish as of the greatest importance, because "names having any allusion to black lead . . . are so extremely common it is difficult to get anything of a distinctive character." An ability to ensure effective advertising was the prime concern. Ferens noted that " . . . a galloping Zebra cut out for transparencies in windows, metal tablets etc. would be very striking associated with the words 'Stove Polish'."[77] The "Zebra" trademark was the first time that an image rather than the name of the company was used to represent product identity, but the company latched on to this theme:

74. Directors' minute book, no. 1A, 2 Dec. 1903, R 214; Directors' minute book no. 2, 4 June 1907, R 213, R&C.

75. Board meeting minute book, 1 Nov., 1 Dec. 1912, R 217, R&C.

76. Chapman-Huston, *Sir James Reckitt, a Memoir*, 160; Ferens' copying book, 16 Oct. 1872, R 8, R&C.

77. Ferens' letter book, Sept. 1890, R 290, R&C.

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An advertising card for Zebra Paste Grate Polish. Reckitt's developed this product to be competitive with the American-produced "Enameline," expending a great deal of effort to create a polish in easy-to-use paste form. The "Zebra" line was one of several Reckitt's product names that lent themselves to memorable and attractive advertising images. Image reproduced with the kind permission of Reckitt Benckiser plc.

"Zebra" brand enamel grate polish followed in 1893 and the "Robin" trademark for starch in 1899.

As a semi-block black lead, Zebra was an improvement on the hard-block Black Diamond black lead that was often dusty or dirty to use. Sales grew rapidly, home sales of black lead rising from 12.8 percent in 1886 to 28.3 percent in ten years.[78] But another American black lead was introduced in the United States (by Prescott) in the form of "Enameline" paste in flat, round tins, and it began to gain ground quickly both on the Morses' Rising Sun and on Reckitt's Zebra. Methods of transforming Zebra into a paste involved experimentation with three spreading agents: wax, bar soap, and soft soap. Difficulties in achieving success led the company to seek expert advice from a qualified chemist, Carr Robinson, a lecturer at the Royal Institute in Hull, who acted as a consultant. Sworn to secrecy by contract and assisted by another chemist, Robinson's task was to devise a

78. Upton, "Record of UK sales."

product that possessed characteristics similar but superior to "Enameline." An oil-based soap eventually solved the problem. Zebra paste enamel grate polish was in production from 1893, packed in 3-ounce tins. Not until 1900, however, after further experimentation with ingredients and improved "tin fit," was the formula deemed to be soft and long-lasting enough to compete effectively with the "Yankee pastes."[79] Meanwhile, in 1896, Reckitts bought the Morses' "Rising American Sun Stove Polish" business in Britain for $200,000 cash, plus £40,000 for Chancellor's agency for the exclusive selling rights of Rising Sun in Britain.[80]

Henceforward, chemists played an increasing role in the process of product development, although, as before, competition rather than "pure research" was the trigger for experimentation. The response to Ripley's introduction of a new "Oval" black lead to compete with Zebra was the appointment of John Harger to assist C. H. Hardy, the company's chief chemist and after 1901 manager of the Kingston blacking factory. Harger was sent to the United States to observe American methods of producing carbon black, while Hardy received a salary plus bonus, the latter contingent on the successful development of a method of purifying graphite from raw lead and payable after the construction and satisfactory functioning of a commercial-scale plant.[81] The modified Zebra product was tested in a number of towns, the introducers (assistant salesmen) reporting to the managers on the effect on sales.[82] In 1906 the addition of dextrine reduced the dust from carbon black by hardening the block.[83] In the following year, competition from Hargreave's "Oval Black" and from "Nilux" in Ireland prompted Reckitt's to increase the proportion of carbon black in its product from 17 to 25 percent.[84] In a series of incremental changes to balance quality with costs, in 1909 Hardy developed a "B new soap" recipe that made possible a reduction in carbon black without adversely affecting quality, promising potential annual cost savings of between £6,000 and £7,000.

At the same time, the directors were aware of the potentially adverse effects of the growing institutional and household use of brass and copper on the market for black lead polishes. Ferens told his fellow directors: "we should have another string to our bow. There

79. Ferens' letter book, 29 Sept. 1890, 19 May 1892, 25 Sept. 1893, 24 Feb. 1905, R 290, R&C.

80. Directors' committee meeting minutes no. 2, 12, 13 May 1896, R 249, R&C.

81. Directors' minute book no. 1A, 6 Nov. 1900, 6 Feb. 1901, 1 Sept. 1903, R 214, R&C.

82. Directors' minute book no. 2, Dec. 1904, R 213, R&C.

83. Ibid., 2 Sept. 1906.

84. Ibid., 4 June 1907.

is a very good margin of profit. Metal polish is . . . a growing thing."[85] The same message had been sent from Australia by Reckitt's sales manager based in London, who in 1901 undertook one of his regular visits to monitor branches, agents, the company's travelers overseas, and the other competitors in the Australian market. He referred to a good potential opening for a first-class metal polish: "Globe metal polish [made in Britain] is known but not pushed and has a small sale. Travelers are making inquiries and obtaining prices and samples. 'Brilliantshine,' a liquid metal polish (sample to follow) leads, and it is advertised on walls and hoardings but in a very indifferent way."[86] The company's American branch secured samples of another liquid polish, also introduced in the United States. Between 1902 and 1905 Reckitt's chemists experimented with formulas until the directors were satisfied that their product was superior to the competition's, just as Zebra was regarded as superior to Enameline. The departure of three of the company's chemists during this period (though all were replaced) may be evidence of the difficulties that this research encountered.

The outcome, in 1905, was a liquid metal polish, "Brasso," aimed initially at large-scale potential users: hotels, railways, infirmaries, hospitals, and large shops.[87] Brasso proved to be an immediate and enduring success, leading the directors to purchase the goodwill, name, and business of "Silvo," a liquid silver polish that achieved a similar success when it was launched in the U.K. market in 1914.[88] Reckitt's success in developing the trade in metal polish, which offset the stagnation experienced in the sale of other products (see Table 5), did not induce complacency, however. Writing from the United States on a monitoring visit in 1909, W. H. Slack, Reckitt's sales manager, reported: "I have impressed upon the travelers the importance of letting us know where there are opportunities for developing in other lines."[89]

By 1904 successful competition and rapid growth in sales enabled Ferens to claim that Reckitt was the world's largest manufacturer of black lead for domestic purposes.[90] From this position, and having demonstrated an ability to establish strong brands in different segments of the polish market, in 1910 the directors asked the manager of the Kingston Works to set his chemists to experiment with a view

85. Ferens' letter book, 28 Feb. 1902, R 293, R&C.
86. Slack's letter book, 28 Jan. 1902, R 51, R&C.
87. Ferens' letter book, 9 June 1905, R 293, R&C.
88. 9 May, 6 Dec. 1912; 30 Jan. 1913; 4 Dec. 1914; 9 April 1915, R 217, R&C.
89. Slack's letter book, 26 Oct. 1909, R 53, R&C.
90. Ferens' letter book, 6 June 1904, R 293, R&C.

to producing a new boot polish. Two years later, the board decided not to introduce the product resulting from this developmental research under a new brand name but to exploit an existing one, and Reckitts spent £54,357 to acquire the well-established Master Boot Polish Company of West Bromwich in 1912.[91] The same year saw the purchase of William Berry, Ltd., a company possessing polish factories in London and Manchester, and the amalgamation of Reckitt with "Cherry Blossom," which was owned by the Mason brothers. Formed in 1886 to make soft soaps, washes, and dips for the agricultural trade, the Masons' company had entered the wax shoe polish trade (by then in existence for more than twenty years) in 1907 with Cherry Blossom, a polish based on a formula developed by the Masons' chemist. "Mansion" furniture polish was launched in the same year. The acquisition of an interest in the Mason brothers' products completed the process by which Reckitt's increased its own sales potential and eliminated anticipated competition from the major established boot polish makers.[92]

Product Development at Lever Brothers

The third company under consideration is Lever Brothers. From his origins as a grocer, William H. Lever initially grew preoccupied with selling soap for household use. Later he observed, "[T]he grocery trade has been a university training for me in the marketing of goods sold by grocers," a view that also helps to explain the development of Lever's product range.[93] The distinctiveness of the traditional bar soaps supplied to the Levers' grocery store by several soapmakers resided not in the differences among the soaps but in the "Sunlight" trademark that Lever applied to all of them. He promoted them locally and regionally as a unique range of uniformly high-quality soaps. The "Sunlight Self-Washer Soap," introduced in 1884, and initially supplied to Lever to order by other producers, provided the impetus for important innovations in packaging. This soap, as noted

91. Board meeting minute book, 5 Sept. 1912, R 217, R&C.

92. The basis of the amalgamation was the price paid for the Master Boot Polish and Berry companies plus the goodwill of "Cherry Blossom." Annual profits earned up to £81,000 and were divided between Reckitt and the Morse brothers proportionate to paid up capital: one-third to Reckitt and two-thirds to the Morse brothers, who became life directors of the new company. Ibid., 6 June 1912, 8 Jan. 1913.

93. Lever to Kingzet, 13 Oct. 1922, Lever Correspondence, 9526, Unilever Historical Archives, London.

earlier, was made from oils rather than tallow, and the need to protect it from the open air led Lever to wrap each tablet in imitation parchment and to dispatch it to grocers in cartons, a practice he had learned from American soap makers.[94]

Success led to opposition from his manufacturing suppliers, and in 1885, as raw material prices fell, Lever integrated backward by acquiring Winser & Co., a small soap-making business in Warrington. Lever retained the works manager, who was a trained chemist, and the soap boiler to form the knowledge and skill base for practical soap-making, while his own role was that of "advertising manager, cashier and sales manager all in one."[95] Within three years the sales of Sunlight Soap, heavily advertised at the national level, were larger than those of any other brand in Britain. This expansion occasioned a move to the larger "Port Sunlight" factory village in 1889.

A significant product development was marked by the introduction of "Lifebuoy Soap" in 1894. Using the residual oil from Sunlight Soap, Lifebuoy was a household soap that contained carbolic acid to inject a disinfectant property. Lever intended Lifebuoy to enter the household as Pears had entered the toilet soap market—with an emphasis on safety and health—and it was part of a strategy that eventually included the acquisition of the Pears enterprise in 1914. In 1897 Lever acquired his first overseas company, Curtis Davis of Boston, which manufactured "Welcome Soap," a household soap of the filled variety that suited the American preference for large bars. In 1899 Lever acquired "Monkey Brand" scouring soap and "Crystal Soap" made by the American firm of Benjamin Brooke. Equally important was the "Refined Toilet Monkey Brand," recommended for "occasional" use as a dentifrice. The monkey figured prominently in all publicity.[96]

The acquisition of this line heralded Lever's entry into the toilet soap market then dominated in Britain mainly by Pears, Gibbs, and Vinolia. The target market is indicated by the name of Lever's new line, introduced in 1902, "Velvet Skin Soap," though it was the less aptly named "Plantol Soap," introduced in 1903 and derived entirely from vegetable oils, that represented a more substantial product development. The purchase of Pugsley Dingman & Co. of Toronto in 1906 brought "Comfort Soap," Sunlight's principal competitor in Canada, into the Lever range; six others followed.[97]

94. Wilson, *History of Unilever*, 1: 28–31 (although both Colman's and Reckitt's already used wrappers).

95. Ibid., 33.

96. Ibid., 205.

97. Ibid., 193–96.

Simultaneous to the acquisition of Monkey Brand in 1899 had been a more substantial innovation in the form of "Sunlight Flakes," which, by the standards of the trade, merits the description "revolutionary."[98] Very fine milling produced a mild soap-flake, which offered instant solubility and lathering in warm water. The technique was not new—laundries and housewives had flaked soap manually in the nineteenth century—but the technology had not been commercially applied. The sight of some particularly fine millings was the stimulus for Lever's innovation, and he introduced machinery adapted to facilitate volume flake production into the factory in 1899. Within a year, the name of the product changed from "Sunlight Flakes" to "Lux," probably on the suggestion of the same Liverpool trademark and patent agent who in 1884 had coined the Sunlight Soap brand name. Lux flakes were "a new preparation for flannels, woollens, the toilet and bath." Also novel was the sale of soap in a box for consumers' convenience, the large "LUX" trademark giving the product immediate recognition.[99]

Washing soaps in powdered form were used for heavier fabrics, as was Sunlight Soap, so they constituted direct competition. When sales began to falter with the intensification of competition after 1906, Lever acquired R. S. Hudson, which specialized in powders, including "Omo," which had established a market mainly for use in washing dishes, pots, and pans. Lever's chemists also developed a powder formula with a high fatty acid content, resulting in the production of a soap designed to reduce the labor of scrubbing by soaking overnight—hence the advertising slogan "we work while you sleep" when "Rinso" was put on the market in 1910. The historian of Unilever, Charles Wilson, suspected that the idea for developing Rinso originated in Germany, where soap powders of high detergent value were already popular and where, in 1910, Lever's purchased a one-half share in one of that country's largest soap powder manufacturers, Dr. Thompson's "Seifenpulver." Seifenpulver was a major competitor of "Persil," the chemical company Henkel's powder, whose strong bleaching action had attracted consumers across continental Europe.[100] Between 1910 and 1913, several acquisitions widened Lever's product range and reduced competition. Most were small and added marginally to product differentiation. The most important of these were the relatively large companies of Joseph Wat-

98. Ibid., 57.

99. Rare Book, Manuscripts, and Special Collections Library, Duke University. Lever Bros., Information centre records, files, and accounts: packaging, 1900–20, "'Lux' Flakes. Packaging's Hall of Fame," *Modern Packaging* (Sept. 1950), 104–6.

100. Wilson, *History of Unilever*, 1: 189.

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Developed by Lever at the turn of the century, flaked soap was a true innovation, leading the company to change the name from "Sunlight Flakes" to "Lux" in order to emphasize the product's originality. The flaked form allowed soap to dissolve much more quickly and allowed packaging in consumer-friendly boxes, as shown in this advertisement. Image reproduced with the kind permission of Lever Fabergé and Unilever Historical Archives.

son of Leeds (the market leader in the northeast) and John Knight, whose dominance in the London market owed something to Castile toilet soap, aimed at the middle classes.

Until 1900 product development owed little to expenditure on research. In 1890 the small laboratory at Port Sunlight was used for testing raw materials and quality control, though even these activities, according to Wilson, were "considered a state secret."[101] The problem that led to a shift toward exploratory research and the setting up of the first research laboratory, probably in 1911, was the search, begun in the early 1900s, for ways of converting crude whale oil into useable raw materials for soap production. The fact that "Lux" flakes developed out of experimentation implies, however, that some form of product-directed research dates at least from 1899. In 1905 J. L. Buchanan, described by Wilson as expert technically but lacking influence over Lever, was appointed manager of the Chemical Department, which then comprised eight research staff.[102] One staff member experimented with the crystallization of an ordinary washing soda into small pieces, offering the potential for producing scented preparations for use in the bath, bath crystals at that time being the preserve of "Bond Street" dealers. Lever decided not to proceed, however, because of the expense of the preparation and application of perfumes and the necessity of selling through chemists and druggists, who would require higher profit margins than grocers; these factors would limit profits to those derived from manufacture.[103]

In 1911 Lever's appointed J. Lewkowitch as a consulting chemist at an annual fee of £1,000. His brief was to advise on matters of interest including seeds, products, processes, plants, operations, and patents, and to visit the Port Sunlight Research and Experimental Laboratory when required.[104] A research committee was set up in 1912 consisting of four graduates, a biologist, and three chemists, whose task it was to avoid duplication in the work of the research staff, to help schedule work, and to provide guidance for overall management.[105] Lever himself was active in seeking household products to extend and add to the range of soaps the company produced. In 1912 he visited the polish factories of C. H. Parsons (boot polishes) in Ashby de la Zouch and J. Baker & Sons (metal polishes) to observe

101. R. J. Taylor, *Unilever Research at Port Sunlight* (1970); Wilson, *History of Unilever,* 1: 37.

102. Wilson, *History of Unilever*, 1: 214.

103. Lever to Goss, 12 June 1908, Lever correspondence, 182, UHAPS.

104. Lever to Lewkowitch, 1 Jan.1911, Lever correspondence, 567, UHAPS.

105. Taylor, *Unilever Research*, 3–6.

the results of their experiments with formulas to produce new polishes in an expanding market.[106] There is no record of further action.

Thus, before 1914, Lever's product development was restricted to the market for soaps for household and toilet uses. Internal development produced the most important product innovations, though imitation after acquisition was another significant method of product development. Differentiation through acquisition expanded the brands on offer without substantially adding to the product range. In 1907 Lever articulated the principle on which the company's policy of product development through backward integration was based: "that we only grow for the soap kettle, therefore bananas are grown to feed the labor force; coconut planting is tempting as is rubber. So far have resisted rubber, but we must have a plant other than coconut to attract various insects."[107] Before 1914, therefore, the approach to product development was pragmatic; research was empirical and focused entirely on the trade in soap.

Analyzing Consumer Product Innovation and Development in Britain

The history of product innovation and development in each of the three firms examined underlines the importance of competition in stimulating change and in shaping its direction. Although the size and extent of Lever's operations by the early years of the twentieth century were substantially larger in scale (if narrower in scope) than those of either Reckitt or Colman, there are similarities in their approaches to product innovation and development. An analysis of the three companies' changing product portfolios indicates that incremental innovation, through imitation and modification rather than by invention and radical breakthroughs, was characteristic of product development in the household goods sector.

Directors and managers were the sources of the ideas that underlay the process of product search and strategy. Commercial travelers also played a part, not least in reporting on the potential for success of new products or lines in both overseas and regional domestic markets. Observance of consumer behavior in overseas markets, notably North America and Australia, proved to be an especially fruitful form of market research. The limited product diversification undertaken by Colman's and Lever's and the broader diversification of Reckitt's product range were the outcomes of explicit marketing log-

106. Lever to Buchanan, 27 Dec. 1912, Lever correspondence, 7332, UHAPS.
107. Lever to Goss, 22 June 1907, Lever correspondence 182, UHAPS.

ics, based on experience in the production of consumer chemical household goods marketed within well-established distribution networks of wholesale and retail grocers. Alertness to novel product developments overseas was important to both Reckitt and Lever during this period, presaging either the purchase of manufacturing rights or outright acquisitions of brands, with or without manufacturing capacity. In the case of Colman's, the chance addition of products through the acquisition of companies active in fields outside Colman's traditional lines would have important effects on the firm's policy and development after 1914.

In the forty years before World War I, the search for new consumer products and product innovation was not research-driven. Research laboratories were staffed by small numbers of qualified personnel who concentrated almost entirely on quality control; they restricted experimentation to that concentrated on development—on the "D" rather than the "R" in R & D—in accordance with instructions from partners and directors. Managers acknowledged the need to introduce new products and product lines, but there were no attempts to alter organizational capability for systematic searches for new products. In a sector in which few products possessed substantial differences from those of competitors, successful product development was critically dependent on companies' overall marketing strategy, including packaging, sales organization, deployment of staff, and advertising at home and overseas.[108]

The histories also suggest that the ranking implied in the modified classification contained in the BAH tables (even when the implied ranking of innovations is removed) conceals both the relative importance of the various types of development for the companies' competitive performance and the relative contribution of internal development and acquisition. Colman's eventual success in monopolizing mustard production was based on branding and effective advertising, until the acquisitions of remaining companies began in 1900. The adoption of Orlando Jones's rice starch was one of the bases of success in the starch trade before 1870, though it was only with the acquisition of Hickman, Dixon & Co., and Dixon's special knowledge, in 1873 that rice starch became a major product. The acquisition of the patent rights to Fairy Glaze in 1900 for a time enabled Colman's to withstand mounting and effective competition from Reckitt's Robin Starch, while Colman's acquisition of the product

108. On these elements in the period before 1880, see Roy Church and Christine Clark, "Creating Competitive Advantage in the Marketing of Branded Packaged Consumer Goods: J. & J. Colman and Isaac Reckitt & Sons in Early Victorian Britain," *Journal of Industrial History* 3 (Aug. 2000): 94–115.

range of Keen Robinson & Co. in 1902 and of Farrow's in 1912 was of much greater long-term significance. Though the outcome was unintended, these lines provided the foundation for the diversified food and drink products that the company was to develop after World War I. In 1899 the purchase of the manufacturing rights to the German Double Composite Starch enabled Reckitt's to replace Colman's as the leading starch-making company in Britain. An improved rice-based starch, it was quickly modified by Reckitt's chemists and effectively branded as Robin Starch, packaged distinctively, with each envelope containing measures related to a specified volume of water in order to produce an optimal washing solution. Reckitt's leadership in the blue trade thus was as much a result of packaging as of color quality, as the rapid growth of the sales of Bag Blue showed; Reckitt's challenge to Colman's starch sales was similarly sharpened by the picture box innovation in the 1870s.

The Reckitts' initial diversification into the production of black lead was an internal development, as was the highly successful development of Zebra, launched in 1890 to compete with the new, more effective American stove polish Rising Sun. To remove competition, however, Reckitt's purchased from the American Morse brothers the rights to manufacture and supply their product to the British and Empire markets, acquiring their entire business in Britain in 1896. The BAH taxonomy does not capture this subtle dynamic of internal product development via the establishment of potential competition followed by acquisition (which also occurred in the subsequent development of Brasso and other metal polishes). The case of Lever's Sunlight Flakes further underlines this weakness. Under the BAH system, the classification of this product is 3a; yet, measuring it by the effect on Lever's sales and profits, Charles Wilson described it as "truly revolutionary."

The BAH schema suffers from other shortcomings. It excludes byproducts, which were of some long-term significance for Reckitt's history after 1914, following advertising of starch for toiletry use beginning in 1911. It also excludes raw materials as products. Reckitts began to produce ultramarine for blue manufacture in 1884, the first of a series of integrative moves—into the production of tin cans in 1907 and into the mining of earth and graphite used to make polish. In each of these cases, the primary motive was to ensure control over supplies; and the exploitation of joint supply explains Lever's creative use of oil waste to produce Lifebuoy.[109]

109. Reckitt, *History*, 42, 51, 56; Wilson, *History of Unilever*, 1: 55–56.

However, the most fundamental flaw of the BAH system is that its ranking of innovations from major to minor exhibits a bias toward the definition of a product in terms of the technology needed to produce it and of its use value; the schema relegates purely marketing factors to the lower end of the spectrum. Degrees of difference, rather than effects on companies' sales or profit performance, are the basis for category rankings. The finding that most innovation in the three companies clustered around 5a (new items in an existing product line, to be sold in an existing market) suggests that these categories are the most important (in the sense that they define the major *forms* of competition) for manufacturers of household goods in the period under discussion. The most useful schema would fit the specific characteristics of a particular product market and the types of innovation that had the most significant effects on companies' sales and profitability. The problem raised by this otherwise optimal methodology is the requirement of adequate data; in the case of two of the three large but privately owned and managed companies analyzed here, such data have not survived. And even such a modified system would retain the weakness that it cannot capture the dynamics of product development in the form of policymaking, resource allocation for research and development, advertising, and acquisition strategies.

These are shortcomings that cannot easily be overcome. It is possible, however, to counter the objection to bias by regarding the BAH categories of product innovation as descriptive rather than normative. As a starting framework for our analysis, the application of this taxonomy, supplemented by an examination of corporate policies, has enabled us to draw several conclusions. First, imitation and modification, rather than invention and radical breakthroughs, were characteristic of product development in the household goods trades, and trademarking and advertising were crucial to growth and leadership in the markets in which these companies traded.[110] Second, companies' marketing their products within well-established distribution networks encouraged diversification in related grocery lines. Third, developmental interests and intelligence regarding market potential communicated by commercial travelers, rather than research, drove the search for new products within the firms; and awareness of novel product developments overseas was also part of the search process. Fourth, in line with Mira Wilkins's analysis of trademarks,

110. For the period before 1880, Church and Clark, "Creating Competitive Advantage," deal with these aspects of marketing in two of the companies. For Lever Bros., see Wilson, *History of Unilever*.

branding was an important competitive strategy, and the acquisition of others' brands was a significant means of product innovation. Targeted advertising policies were an important method of reinforcing brand strengths. These avenues, rather than technology, were the routes to monopoly power and corporate growth.[111]

Thus, although the BAH schema is flawed, we suggest that, by facilitating systematic comparisons among business enterprises in the same or different sectors, an approach that adopts a taxonomy of the kind employed here can advance the prospects of establishing valuable generalizations concerning the behavior of firms and the historical dynamics of business.

111. Mira Wilkins, "The Neglected Intangible Asset: The Influence of the Trademark in the Rise of the Modern Corporation," *Business History* 3 (1992): 66–95; Roy Church, "Advertising Consumer Goods in Nineteenth-Century Britain: Re-Interpretations," *Economic History Review* 52 (Nov. 2000): 621–45.

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